Contrasting expression of keratins in mouse and human embryonic stem cells.

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Public Summary:

Scientific Abstract:
RNA expression data reveals that human embryonic stem (hES) cells differ from mouse ES (mES) cells in the expression of RNAs for keratin intermediate filament proteins. These differences were confirmed at the cellular and protein level and may reflect a fundamental difference in the epithelial nature of embryonic stem cells derived from mouse and human blastocysts. Mouse ES cells express very low levels of the simple epithelial keratins K8, K18 and K19. By contrast hES cells express moderate levels of the RNAs for these intermediate filament proteins as do mouse stem cells derived from the mouse epiblast. Expression of K8 and K18 RNAs are correlated with increased c-Jun RNA expression in both mouse and human ES cell cultures. However, decreasing K8 and K18 expression associated with differentiation to neuronal progenitor cells is correlated with increasing expression of the Snai2 (Slug) transcriptional repression and not decreased Jun expression. Increasing K7 expression is correlated with increased CDX2 and decreased Oct4 RNA expression associated with the formation of trophoblast derivatives by hES cells. Our study supports the view that hES cells are more similar to mouse epiblast cells than mouse ES cells and is consistent with the epithelial nature of hES cells. Keratin intermediate filament expression in hES cells may modulate sensitivity to death receptor mediated apoptosis and stress.